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The Use of Tree Species for Wooden Artifacts Excavated from the Relics around Lake Biwa*¹

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Introduction

It is said that Japan has "Wooden Culture". Japanese has been living with a close interaction to the forest. However, it is not sufficiently clear how they have developed the utilization of wood in the Japanese archipelago which has the various flora. In this study, tree species of wooden artifacts excavated from three relics around Lake Biwa were anatomically identified. Based on the identification of tree species, we studied the way for species selection characteristic to the respective purpose and inferred the forest environment surrounding those site in the past.

Materials and Methods

The three sites which were studied are the Akanoi-wan Site (from Jomon - to Kamakura Period) in south of Lake Biwa, the Enshouji-kotei Site and the Onoehama Site (from Middle to Late Yayoi Period) in north of it. The number of samples in those sites is in turn 1869, 273 and 165 pieces. Hand-section of samples were made and identified by a microscope.

Results and Discussion

Among 2307 wooden artifacts in total, 47 taxa were identified, including 1630 samples of conifers and 677 of broad-leaf trees. Among broad-leaf trees, evergreen species were dominated in Akanoi-wan Site and deciduous species were dominated in the other two sites. It seems that the difference of composition in broad-leaf trees reflected the climatic difference. In Akanoi-wan Site and Enshouji-kotei Site, *Cryptomeria japonica* was dominated

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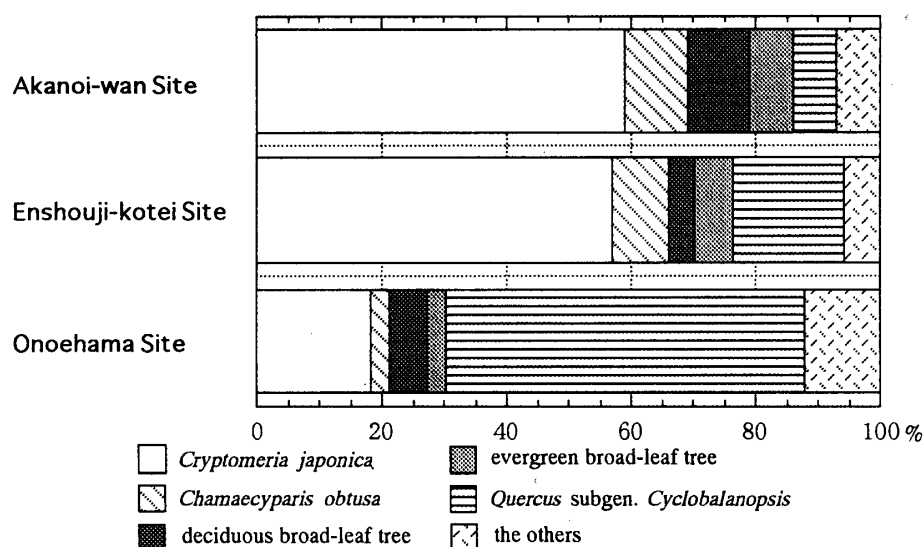


Fig. 1. A comparison of the ratio of excavated tree species among three site around Lake Biwa.

with about 60% of the assemblages. They were used in large quantities for most kinds of wooden artifacts. On the other hand, for examples, the hoes were exclusively made of *Quercus subgen. Cyclobalanopsis* and most pounders were made of *Camellia japonica*. These results suggest that the appropriate species selections for respective purposes is the common knowledge for the ancient people living around Lake Biwa. On the whole, appropriate species were selected for the respective purpose in terms of mechanical properties with the only exception of many spades made of *Cryptomeria japonica*. Because the shapes of the spades were different from those made of *Quercus subgen. Cyclobalanopsis*, they could not be definitely categorized as spades or oars for archeologist¹⁾. However, in this study, most spades in question were made of *Cryptomeria japonica*, which may indicate that they are categorized as oars in terms of mechanical properties of wood.

We applied the multivariate analysis to the percentage of species previously excavated in 19 sites which are located in Hokuriku, Tokai, Kinai, and Siga Prefecture including Akanoi-wan Site and Enshouji-kotei Site. The compositions of species in the sites around Lake Biwa are similar to those in the sites of Hokuriku and Tokai in that *Cryptomeria japonica* is dominant. However, they also have something in common with the sites of Kinai for the abundance of *Chamaecyparis obtusa*. At least from The Latest Jomon to The Asuka Period, the abrupt change of this tendency for the utilization of various timber in Akanoi-wan Site was not clearly demonstrated.

(1) Until about The Early Kofun Period, the excavated species utilized in the past are likely to reflect the vegetation of the local area²⁾. (2) *Cryptomeria japonica* occurred with high frequency in the past pollen analysis around Lake Biwa³⁾. (3) *Cryptomeria japonica* were abundantly used for the most kinds of wooden artifacts. On the basis of these reasons, we

presume that the natural forest composed of *Cryptomeria japonica* as a dominant species had been developed around Lake Biwa in the past.

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